

## \* NOTICES \*

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the cream solder used for mounting electronic parts in the circuit board.

[0002]

[Description of the Prior Art]In mounting electronic parts in the circuit board conventionally, Cream solder is printed with screen printing etc. to the pad of the circuit board, the lead of electronic parts is laid on it, and it heats through this to a reflow furnace, and melting of the cream solder is carried out and the method of soldering a lead and a pad is taken. Cream solder mixes an active agent etc. with solder powder a binder, a viscosity controlling agent, and if needed, and makes them creamy (paste state).

[0003]

[Problem(s) to be Solved by the Invention]Although minuteness making of the array pitch of the pad of the circuit board is carried out and an about [ 0.5mm ] array pitch can respond with the conventional cream solder with the miniaturization of electronic equipment and electronic parts these days, If it becomes a pitch smaller than it, between pads, it is generated by the bridge of solder and good soldering cannot be performed.

[0004]Since it is necessary to apply the conventional cream solder to each pad correctly so that a \*\*\*\*\* pad may not be straddled, exact printing technique is required, and the printing itself will become difficult if pad intervals become small.

[0005]

[Means for Solving the Problem]This invention provides cream solder which can respond to a pad with a smaller array pitch with quite rough printing technique in view of a problem of the above conventional technologies.

[0006]Cream solder of this invention has the feature in a point that content of solder powder is 45 or less % of the weight, and contains cellulose six to 20% of the weight, and the remainder is a binder, a viscosity controlling agent, etc. for obtaining adhesiveness as cream solder, viscosity, etc. An active agent etc. can also be included if needed.

[0007]accepting necessity besides this, although eutectic solder is usually used as solder powder -- tin -- rich solder and lead -- rich solder or a thing which mixed them can be used.

[0008]A binder is the same as usual and organic acid etc. which replace rosin or it are used. A viscosity controlling agent is also the same as usual, and a carbitol system solvent, mineral spirits, etc. are used. CHIKISO agents, such as a caster wax, may be added to this. An active agent is also the same as usual, and amine, halogen, etc. are used.

[0009]

[Function]If it is heated after carrying out the solid coating of this cream solder at the pad-arrays part of 0.3-mm pitch, for example, it can deposit solder on each pad, without producing a bridge.

[0010]This is because cellulose is contained [ that the content of solder powder is more nearly substantially / than the conventional cream solder / small (the solder powder content of the conventional cream solder is about 90 to 95 % of the weight), and ]. Namely, although the grain of the solder in cream solder fuses being generated by the solder bridge between pads with heating, it grows and goes to a big grain, colliding mutually and it thinks for coming to straddle between pads, The probability that a grain and a grain will collide when the grain of solder fuses with heating if content of solder powder is made small is low, and if the upper cellulose is mixed, a collision of the grain of solder and a grain will be barred by it. As a result, an opportunity to grow up to be a big solder grain decreases, and it is considered that a bridge

stops being generated.

[0011]If solder can be individually deposited in each pad, it is possible to solder the lead of electronic parts with the solder.

[0012]Since it will come to check a deposit of the solder to a pad top if it does not have the effect of preventing bridge generating when there is too little content of cellulose, and there is, it is preferred to carry out to about 6 to 20% of the weight. [ too much ]

[0013]

[Example]Hereafter, the example of this invention is described in detail. With the cream solder which made cellulose contain first, in order to find the relation between the content of solder powder, and a bridge incidence rate, it experimented by building the cream solder of a presentation of Table 1.

[0014]

[Table 1]

試料番号		1	2	3	4	5
組成	半田粉 (wt%)	14	28	33	41	56
	セルローズ (＃)	10	10	10	10	10
	粘着剤 (＃)	46	37	34	29	20
	粘度調整剤 (＃)	23	19	18	15	10
	チキソ剤 (＃)	6	5	4	4	3
	活性剤 (＃)	1	1	1	1	1
ブリッジ発生率 (%)		0	0	0	0	40.0

[0015]As solder powder, 450 mesh (particle diameter of 30-40 micrometers) eutectic solder powder was used. moreover — a binder — rosin — the caster wax was used for the CHIKISO agent and cyclohexylamine hydrochloride was used for the active agent for hexylcarbitol at viscosity controlling agent (solvent).

[0016]The pad pitch of the circuit board used for the examination is a glass epoxy board of 0.3 mm (pad width = 0.2 mm, pad intervals = 0.1 mm), After carrying out the solid coating of the cream solder of each presentation of Table 1 in the pad-arrays part, a reflow of it was heated and carried out to the thickness of 300  $\mu$ m, and it washed, and the state of the solder on a pad was investigated.

[0017]A bridge incidence rate is a rate of the bridge generating number to the total number of pads which applied solder. This result shows that a bridge stops arising, when content of solder powder is carried out to about 45 or less % of the weight.

[0018]Next, in order to find the relation between the content of cellulose, and a bridge incidence rate, it experimented by using the same material as the case of Table 1, and building the cream solder of a presentation of Table 2.

[0019]

[Table 2]

試料番号		11	12	13	14
組成	半田粉 (wt%)	30	30	30	30
	セルローズ (＃)	4	8	12	16
	粘着剤 (＃)	40	37	35	32
	粘度調整剤 (＃)	20	19	18	17
	チキソ剤 (＃)	5	5	4	4
	活性剤 (＃)	1	1	1	1
ブリッジ発生率 (%)		28.0	0	0	0

[0020] This result shows that generating of a bridge can be prevented, if cellulose is made to contain 6% of the weight or more. However, when cellulose is made to contain exceeding 20 % of the weight, solder becomes difficult to deposit to up to a pad.

[0021] Therefore, if content of solder powder is made into about 45 or less % of the weight, 6-20 weight content of the cellulose is carried out and the rest gives necessary adhesiveness and viscosity with a binder, a viscosity modifier as well as the usual cream solder, etc., The cream solder which a bridge does not generate in the pad arranged with the minute pitch even if it carries out solid coating can be obtained.

[0022]

[Effect of the Invention] If the cream solder concerning this invention is used as explained above, a solder layer can be formed, without making the pad arranged with the minute pitch about 0.3 mm produce a bridge, therefore mounting of the small electronic parts of a lead pitch can be realized. Since it is not necessary to print this cream solder individually to each pad, and solid coating is only carried out at a pad-arrays part and it can form a solder layer in each pad selectively, a precision does not need printing technique but it is very simple for printing to the circuit board.

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**CLAIMS**

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[Claim(s)]

[Claim 1] Cream solder which content of solder powder contains cellulose six to 20% of the weight at 45 or less % of the weight, and is characterized by the remainder being a binder, a viscosity controlling agent, etc. for obtaining necessary adhesiveness, viscosity, etc.

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[Translation done.]